World Statistics Day
Celebrating the Many Achievements of Official Statistics

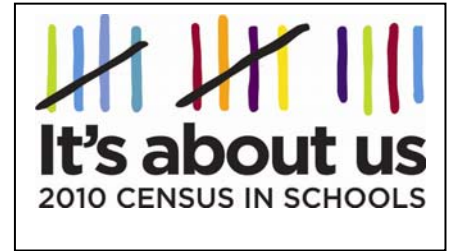**Skills and Objectives**
Students will:
Collect, organize, and analyze data about the state where they live and compare their data with other states

Standards:
Math – Numbers and operations; data analysis and probability
Social Studies – People, places, and environments
Geography – The world in spatial terms, places and regions, and human systems

Background
This lesson introduces World Statistics Day, Federal statistics, the U.S. Census Bureau, and statistics to students as they collect, organize, and analyze a variety of statistics from the Census Bureau's American Community Survey. Students will have the opportunity to examine data about educational attainment and median household income.

Words to Know
Statistics - The mathematics of collecting, organizing, and interpreting numerical data.
Median Income - The amount that divides the income distribution into two equal groups with half having incomes above the median and half having incomes below the median.
American Community Survey - An ongoing survey conducted by the U.S Census Bureau that provides annual demographic data.
World Statistics Day – October 20, 2010

Materials
Student worksheet "Business Decision: Where to Build?" 1-A
Student worksheet "The Value of an Education" 1-B
Student worksheet "Median Household Income" map
Student worksheet "Percent of People 25 Years and Over Who Have a Bachelor's Degree" map

Time Required: One class session

Getting Started
1. Explain to students that on October 20, 2010, countries around the world will celebrate the first World Statistics Day to raise awareness of its importance and the increasing role of statistics in societies and governments around the world. Also, government agencies, businesses, and community leaders use statistics to make educated decisions for their communities.

2. Explain that there are 14 Federal statistical organizations in the United States doing vital work for our nation. One of these organizations is the U.S. Census Bureau.

3. Explain that the U.S. Census Bureau is best known for its complete count of the United States population known as the decennial census, which has been conducted every 10 years since 1790. Ask the students if they remember participating or hearing about the 2010 Census.

4. Explain that the U.S. Census Bureau also conducts numerous other surveys and censuses that are constantly measuring the changing population, social, and economic information for the nation and reports these data to state, local, and tribal governments.

Using the Data

5. Engage students in conversations regarding the uses of census data and how a business might use census data. Have them write their suggestions on the board.

6. Explain to the students that they will play the role of a company that is looking to expand by building a second manufacturing plant. However, the company's employees must be well educated. To select the new location, the company decides to use the Census Bureau's American Community Survey data to identify possible states that would be the best fit for the company.

7. Engage students in conversations regarding a correlation between the level of education an individual has and the income that an individual earns. Ask the students if the level of education affects what a person should earn.

8. Distribute student worksheets "Business Decision: Where to Build?" 1-A and "The Value of an Education" 1-B. Allow students to make their prediction of which five states would have the highest percent of adults with a bachelor's degree.

9. Explain to the students that they will be using data from the U.S. Census Bureau's American Community Survey to identify any correlation between the levels of education and median income.

10. Distribute "Median Household Income" and "Percent of People 25 Years and Over Who Have a Bachelor's Degree" maps.

11. Explain to students that they will create a scatter plot graph by plotting 20 states on the graph that is on "The Value of an Education" 1-B worksheet.

12. Review vocabulary and work with students as a group or assign students to work individually to complete the student worksheet

Wrapping up

Engage the students in a conversation by asking the following questions: Were our predictions at the beginning of class correct or not? Does the educational attainment map help you answer the question posed in the scenario? Where should your company build its second plant? What does this suggest about the relationship between having a college degree and income? Can you see U.S. Census Bureau data as a useful tool? Allow students to share their graphs with the class.

Answers

1. Answers will vary. 2. The work requires high-level skills (e.g., in reading, math) and knowledge (e.g., in science, engineering). 3. Answers will vary. 4. Yes, there will be a direct relationship because well educated people, receive higher-paying jobs. No, there will not be a direct relationship because whether or not you have a college degree does not determine what you can earn (e.g., celebrities, athletes). 5. Answers will vary. 6. Yes, there is a pattern. The areas with the larger percent of individuals with bachelor's degrees were traditionally the areas with a higher median income. 7. Possible answers: You can see patterns; you can see regional differences; it is easier to compare states and regions. 8. Answers will vary. 9. Answers will vary.

1-A

BUSINESS DECISION: WHERE TO BUILD?

Businesses, nonprofit groups, government planners, and community planners use census data to help them make decisions. Your company is a company that specializes in the design and manufacture of diagnostic machines used in hospitals around the world. Your company is so successful that it has outgrown its current facility and has decided to build a second plant. The company needs to decide where to build the new plant. Many states want the company, because wherever it goes it will create lots of new highly paid jobs. However, the company can not go just anywhere; its employees must be well educated. Your company's research department decided to use census data to identify states that could be the best fit for the company.

Use the maps to guide your research for a new manufacturing plant. Before you begin, think about location. What state do you think would work best for a second manufacturing plant? Consider the geography and the other industries that might be in the area.

Before data analysis

1. I think that _____ would be the state for a second manufacturing plant.

2. I think the following five states have a high percent of adults with a bachelor's degree.
   _____, _____,
   _____, _____,
   _____.

3. Why would a company feel that it needed well-educated workers?
   _____
   _____
   _____

4. Why is median household income useful to know?
   _____
   _____
   _____

5. Would you expect to see any relationship between the patterns of educational attainment in states and the patterns of income? Why or why not?
   _____
   _____
   _____

After data analysis

6. Were your predictions of five states correct? Which states surprised you with their percent of people that have a bachelor's degree or higher?
   _____
   _____
   _____

7. Now that you have analyzed the data, how do the patterns of median household income compare to the patterns of educational attainment.
   _____
   _____
   _____

8. What is the value of seeing these data mapped as opposed to seeing them in a table?
   _____
   _____
   _____

9. Is there anything else you think you should consider before making your final decision? If so, what and why?
   _____
   _____
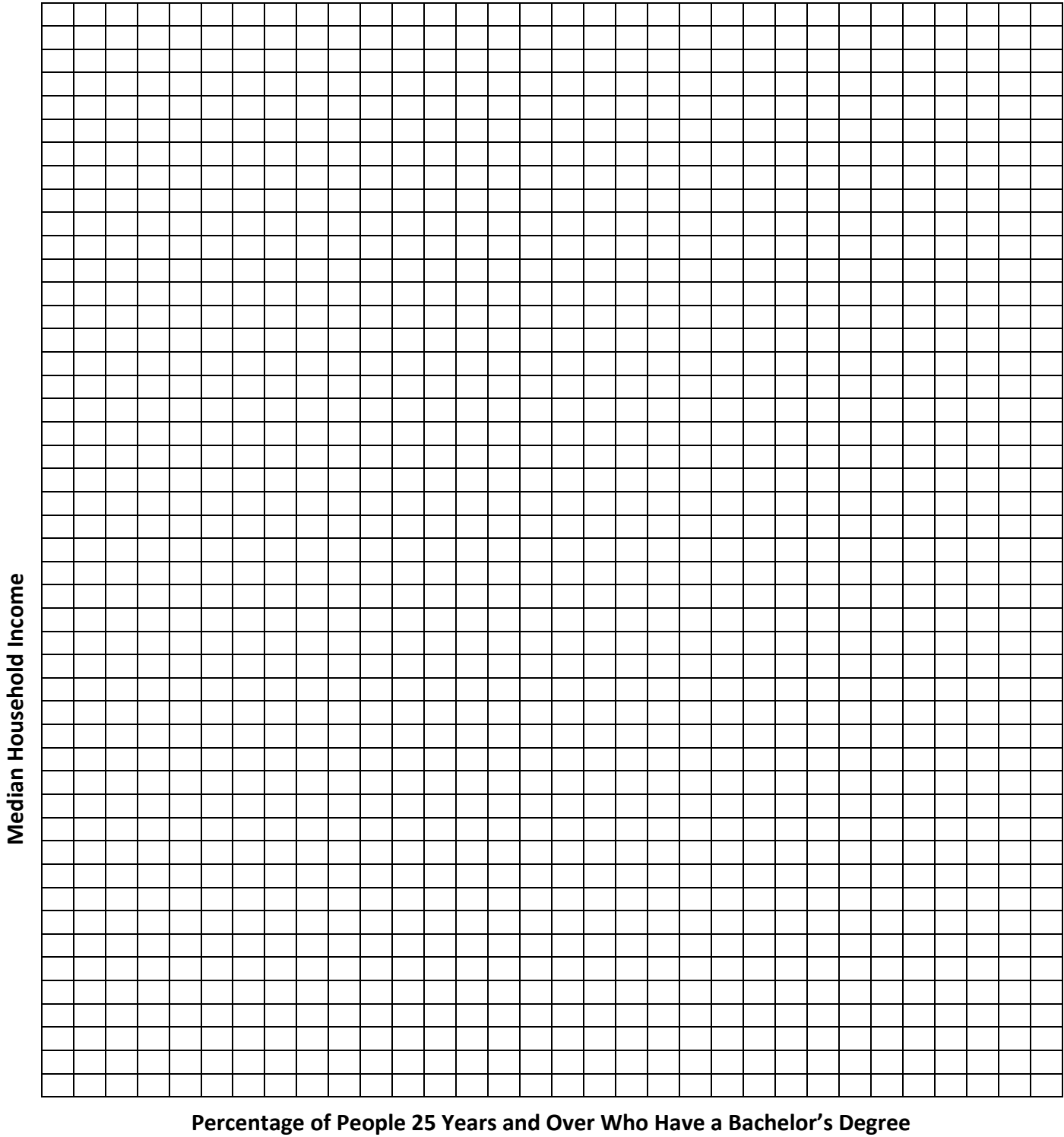   _____

10. Which state is your final choice?
    _____

    Why?
    _____
    _____
    _____

1-B

The Value of an Education

Create a scatter plot graph by selecting and plotting data for 20 states using the data on the "Median Household Income" and "Percent of People 25 Years and Over Who Have a Bachelor's Degree" maps. Use this graph to complete BUSINESS DECISION: WHERE TO BUILD? Worksheet.
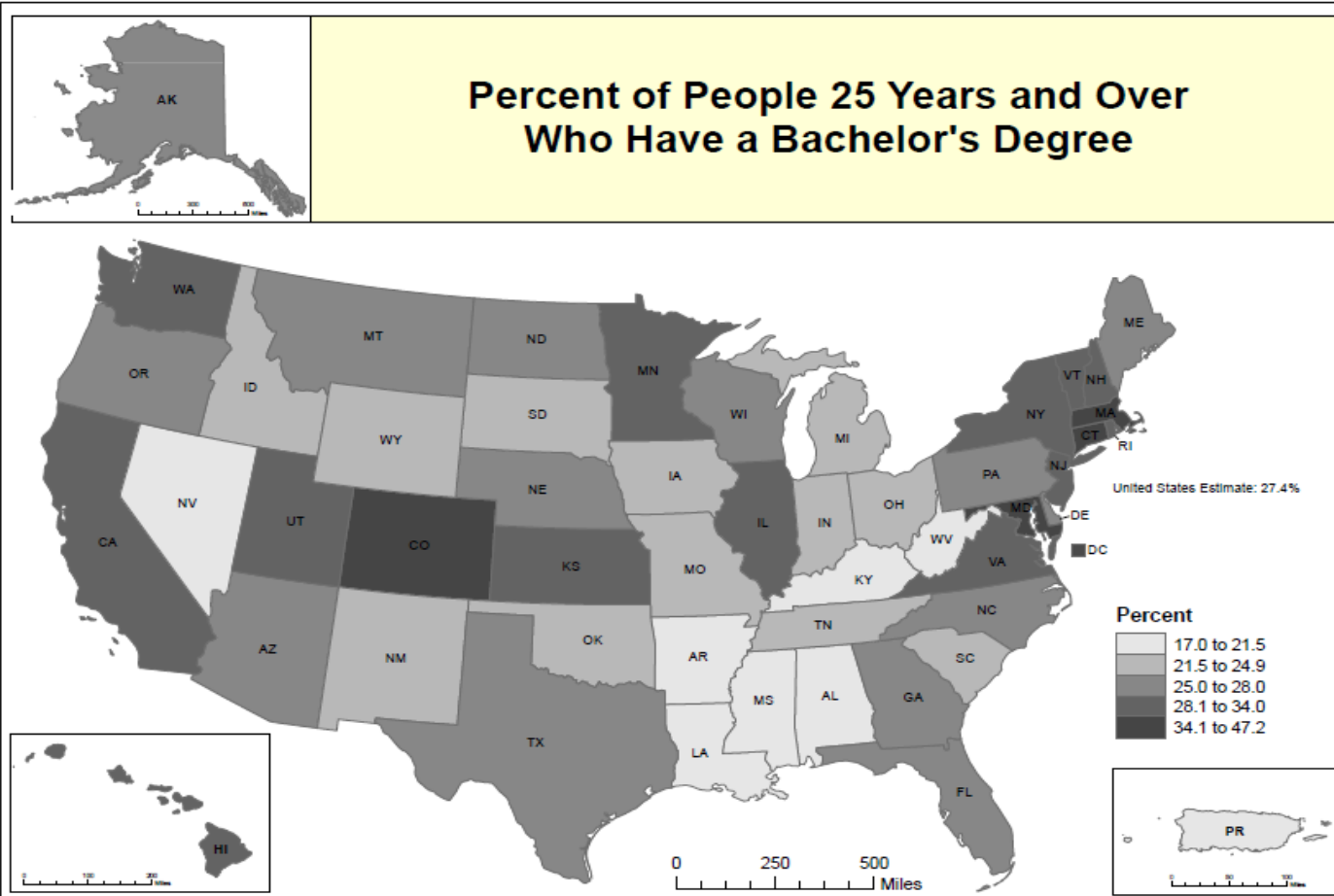
Median Household Income

Percentage of People 25 Years and Over Who Have a Bachelor's Degree

Percent of People 25 Years and Over Who Have a Bachelor's Degree

United States Estimate: 27.4%

Percent
- 17.0 to 21.5
- 21.5 to 24.9
- 25.0 to 28.0
- 28.1 to 34.0
- 34.1 to 47.2

Source: U.S. Census Bureau, 2006-2008 American Community Survey 3-Year Estimates

USCENSUSBUREAU
Helping You Make Informed Decisions

State	%	State	%	State	%	State	%	State	%	State	%	State	%	State	%	State	%	State	%	State	%
AL	21.5%	CO	35.0%	GA	27.0%	IA	24.2%	MD	35.1%	MO	24.5%	NJ	34.0%	OH	23.8%	SC	23.2%	VT	33.1%	WY	23.3%
AK	26.5%	CT	34.8%	HI	29.2%	KS	29.0%	MA	37.7%	MT	27.1%	NM	24.9%	OK	22.4%	SD	24.8%	VA	33.2%	PR	21.0%
AZ	25.3%	DE	26.8%	ID	24.0%	KY	20.0%	MI	24.7%	NE	27.3%	NY	31.6%	OR	28.0%	TN	22.2%	WA	30.5%		
AR	18.8%	DC	47.2%	IL	29.5%	LA	20.4%	MN	31.1%	NV	21.4%	NC	25.6%	PA	25.9%	TX	25.1%	WV	17.0%		
CA	29.4%	FL	25.7%	IN	22.3%	ME	25.9%	MS	19.0%	NH	32.6%	ND	26.1%	RI	29.8%	UT	28.8%	WI	25.5%		

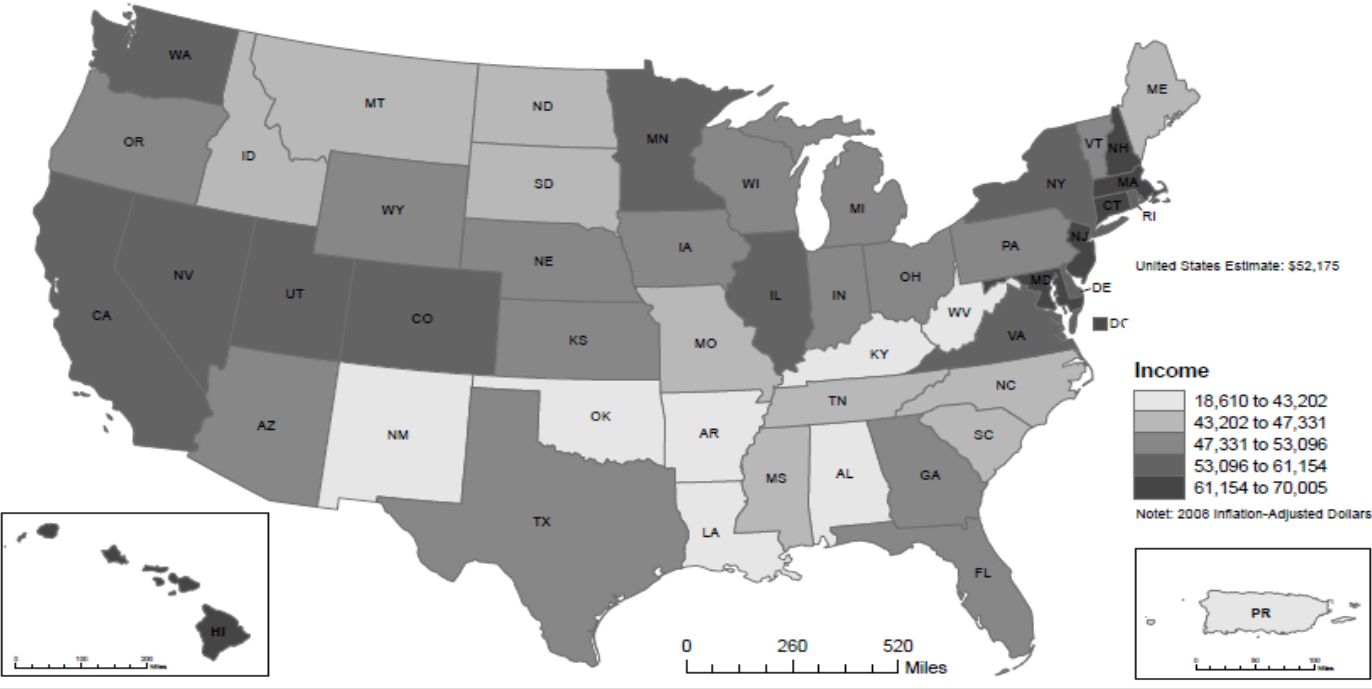**What is the American Community Survey?**

The American Community Survey (ACS) is an ongoing survey that provides data every year -- giving communities the current information they need to plan investments and services. Information from the survey generates data that help determine how more than $400 billion in federal and state funds are distributed each year.

To help communities, state governments, and federal programs, we ask about:

- Age
- Sex
- Race
- Family and relationships
- Income and benefits
- Health insurance
- Education
- Veteran status
- Disabilities
- Where you work and how you get there
- Where you live and how much you pay for some essentials

All this detail is combined into statistics that are used to help decide everything from school lunch programs to new hospitals.

Median Household Income

United States Estimate: $52,175

Income
- 18,610 to 43,202
- 43,202 to 47,331
- 47,331 to 53,096
- 53,096 to 61,154
- 61,154 to 70,005

Notet: 2008 Inflation-Adjusted Dollars

Source: U.S. Census Bureau, 2006-2008 American Community Survey 3-Year Estimates

U S C E N S U S B U R E A U

Helping You Make Informed Decisions

State	Income	State	Income	State	Income	State	Income	State	Income	State	Income	State	Income	State	Income	State	Income	State	Income	State	Income
AL	$42,131	CO	$56,574	GA	$50,549	IA	$48,585	MD	$70,005	MO	$46,408	NJ	$69,674	OH	$48,023	SC	$44,326	VT	$51,704	WY	$53,096
AK	$66,293	CT	$68,411	HI	$66,034	KS	$49,189	MA	$64,684	MT	$44,042	NM	$43,202	OK	$42,541	SD	$45,542	VA	$61,044	PR	$18,610
AZ	$51,124	DE	$57,270	ID	$47,331	KY	$41,763	MI	$49,694	NE	$49,231	NY	$55,401	OR	$49,863	TN	$43,662	WA	$57,234		
AR	$39,127	DC	$56,428	IL	$55,935	LA	$42,634	MN	$57,795	NV	$56,348	NC	$46,107	PA	$50,272	TX	$49,078	WV	$37,870		
CA	$61,154	FL	$48,637	IN	$48,675	ME	$46,807	MS	$46,413	NH	$63,989	ND	$45,390	RI	$55,327	UT	$56,484	WI	$52,249		